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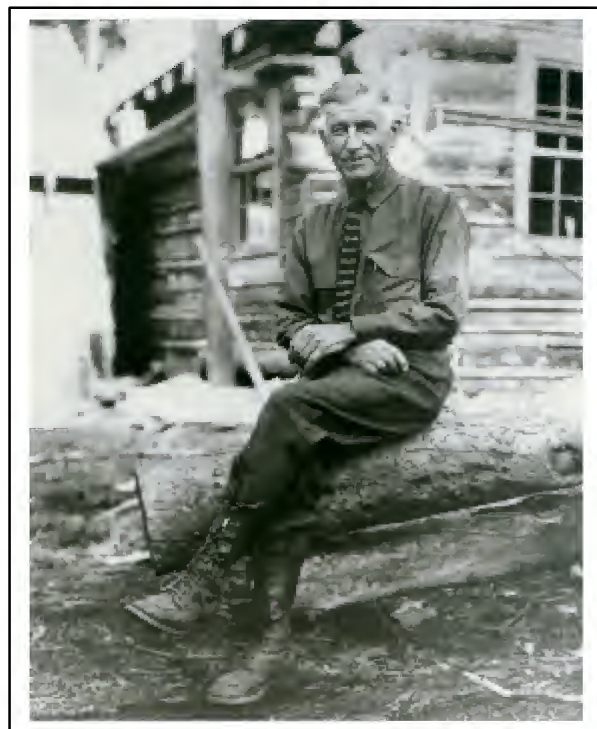
Honoring Wyoming's First Botanist

Each branch of biology in Wyoming that deals with plant life (taxonomy, ecology, range, agriculture, horticulture); indeed, the history of Wyoming botany, reflects contributions of Aven Nelson. The University of Wyoming (UW) would not be what it is today without Nelson's leadership. Recognizing Nelson's legacy of contributions to UW and the advancement of plant sciences, the UW College of Arts & Sciences proudly, posthumously named Aven Nelson as UW Outstanding Former Faculty this spring.

Nelson was a pioneering botanist and contributor to a nascent picture of the flora of North America (Reveal and Pringle 1993). "For nearly a third of a century, Nelson was held to be the preeminent botanist in the Rocky Mountain region; his frequent agricultural and horticultural bulletins made him the patron saint of Wyoming rural folk; he built the Rocky Mountain Herbarium from scratch and gave it the impetus to become what it is today, the foremost collection of plants between St. Louis, Austin, and the West Coast; and he sacrificed this first love to assume the presidency of the University of Wyoming in a crisis..." (Williams 1984). He lent equanimity to some of the most rancorous debates in botany, was an inspiration as teacher (Williams 2003), and advanced economic and social development in the state. bh

Aven Nelson was born on March 24, 1859. Wyoming Native Plant Society is proud to feature him this month as we consider not only Wyoming plant life, but people who are part of the Wyoming botany community.

The UW College of Arts & Sciences awards banquet will be May 13, 2005 @5:30 pm (Union), hosting Nelsons' descendants and other awardees. The event is open (botanists included). To make reservations, contact: College of Arts & Sciences Adv. Off. (766-2755; asdean@uwyo.edu).



Aven Nelson, in Reveal & Pringle (1993). © 2005 Hunt Institute for Botanical Documentation. All Rights Reserved.

References Cited

- Reveal, J.L. and J.S. Pringle. 1993. Taxonomic botany and floristics. Chapter 7, *In*: FNA Ed. Comm., eds. Flora of North America. Vol. 1: Introduction. Oxford Univ. Press, New York and Oxford.
- Williams, R.L. 1984. *Aven Nelson of Wyoming*. Colorado Assoc. University Press, Boulder, CO.
- Williams, R.L. 2003. *A Region of Astonishing Beauty*. Roberts Rinehart Publishers, Lanham, MD.

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WNPS News

2005 Student Scholarship Winner: The 2005 WNPS Scholarship winner, Adam Siepielski, was named by the Board for his PhD research (New Mexico State University) on the geographic mosaic of co-evolution for Clark's nutcrackers and bird dispersed pines in Wyoming and the greater Rocky Mountain region (\$400). Evelyn Hill (University of Wyoming) was awarded second-place for her M.S. research on ethnobotany of Grand Teton National Park (\$200). We are proud to support their research. The Board had a difficult time selecting among the qualified applications. Thanks go out to all who applied... with special thanks to all in WNPS who keep the scholarship fund going.

The sagebrush research by Sally Madden and the ethnobotany research by Evelyn Hill, 2004 scholarship recipients, are reported in this issue (see pp. 4-6). The *Abronia ammophila* taxonomic research of Elizabeth Saunders, 2004 scholarship recipient, will be featured in the May issue.

New Members: Please welcome the following new members to WNPS: Tyler Abbott (Cheyenne), Casper College Library (Casper), Tim and Ann Henson (Longmont, CO), Laramie Community College Library (Cheyenne), Rick Larimore (Champaign, IL), Wanda Manley (Burns), David Medhaug (Glenwood, CO), John Taggart Hickley Library of Northwest College (Powell).

Wyoming Native Plant Society
P.O. Box 2500, Laramie, WY 82073

WNPS Board - 2005

President: Bonnie Heidel	742-9523
Vice President: Laura Hudson	745-8236
Sec.-Treasurer: Ann Boelter	745-5487
Board Members: Mike Evans	326-8217
Katherine Zacharkevics	605-722-4024

THANK YOU to all 2004 Board members!

Treasurer's Report: Balance as of 4 February 2005: General Fund \$877.86; Student Scholarship Fund: \$0.00; Total Funds: \$877.86.

(Thanks to all who renewed!! Memberships are now due at the start of the calendar year rather than the middle of summer. This meant a "short" membership year in 2003. We are now recording renewal dates and trying to make it as easy as possible to stay current. Check the mailing label on this issue for the year that your renewal was last paid.)

By-Laws Report: Response of almost 70 WNPS members during the ballot period qualifies as a groundswell by any state standard; but it does not represent at least 50% of the membership. So the proposed By-Laws amendments to create a life membership category and other measures will be reprinted in the next issue for article-by-article votes at the annual meeting this summer.

2005 WNPS Annual Meeting: Watch for the annual meeting / fieldtrip announcement in the May issue.



Message from the President

Each of us has answers to the questions why we are interested in Wyoming plants and some part of the "plant picture." This newsletter issue focuses on people and perspectives rather than plant topics. It has been an issue that defies conformity or constraints.

Here is the take-home message: Your interests and perspectives are the rationale behind Wyoming Native Plant Society. The inspiration for this newsletter originates with you. The majority of members are in once-a-year mail contact, and that is wonderful in its own right.

...I had originally hoped to serve up a helping of inspiring president's prose. Now, I would be satisfied if I could just hold up a mirror in which everyone saw themselves.

Bonnie Heidel

CELEBRATING WILDFLOWERS at the Buffalo Bill Historical Center/ Draper Museum of Natural History in Cody, WY will be held in July this year – watch for more information in the May newsletter.

Newsletter Editor: Bonnie Heidel (Laramie; email: bheidel@uwyo.edu)

Teton Chapter: PO Box 82, Wilson, WY 83014 (Joan Lucas, Treasurer)

Bighorn Native Plant Society: PO Box 21, Big Horn, WY 82833 (Jean Daly, Treasurer)

Head Webmaster-Tessa Dutcher (tessad@uwyo.edu).

Contributors to this issue: Walter Fertig (WF), Bonnie Heidel (BH), Evelyn Hill (EH), Sally Madden (SM) and Thea Unzner (TU).

Next Wyoming Plant Conference: Moved to Spring 2006

Next newsletter deadline: April 18, 2005

While this issue falls short as a memorial marking botanical greatness, the newsletter will continue in its dedication to these and other people ...as well as plants.

Announcing: The Second Annual Conference of Northwest Herbaria

The University of Idaho Stillinger Herbarium cordially invites botanists of the West to come this spring for the second annual Conference of Northwest Herbaria! The Conference of Northwest Herbaria will be held in Moscow, Idaho, June 3-5, 2005. The program is posted at <http://www.sci.uidaho.edu/biosci/herbarium/conference/index.html>

The Conference of Northwest Herbaria will address issues facing herbaria and conservation centers today. Primarily, the conference offers an opportunity to

increase the communication between these institutions on issues ranging from current taxonomic treatments to computerization of collections. In addition, the conference provides workshops led by recognized experts, designed to enhance the skill levels of field botanists. Lastly, this year the conference will provide an opportunity for botanists throughout the Northwest to experience first-hand the fascinating coastal disjunct ecosystems of North Idaho. Last year's first-ever Conference of Northwest Herbaria was truly a great success. *This year is also the year that the University of Idaho will 'hand off the baton', so that other institutions have the opportunity to host this event in coming years.*

Now available:

Genetically Appropriate Choices for Plant Materials to Maintain Biological Diversity

by Dr. Deborah Rogers and
Dr. Arlee Montalvo

(Editor's Note: The following is from a Forest Service announcement of Andrew Kratz, Regional Botanist.)

A guide was recently released by the U.S. Forest Service – Rocky Mountain Region to help land managers make genetically appropriate choices for native plant materials in revegetation projects. This substantive guidebook synthesizes genetic principles and provides examples of genetic issues relevant in the selection of native plant materials for use in wildlands. It focuses to some degree on fire and timber harvest as large scale disturbances in the Rocky Mountain Region which are frequently seeded to prevent erosion, but the document has a wealth of information that is widely applicable to many different types of revegetation projects here and elsewhere. The document is intended as a tool, and to foster a dialog between land managers and geneticists.

It is available for public download as a PDF file at just over 3 MB in size, posted at: <http://www.fs.fed.us/r2/publications/botany/plantgenetics.pdf>. The Guide was developed under a Joint Venture Agreement between the USDA Forest Service and the Regents of the University of California. UC will also be posting the file on an publicly accessible web site shortly. See the Preface for a brief overview before diving into Chapter 1 to help understand how best to use the document.

Citation:

Rogers, D.L. and A.M. Montalvo. 2004. Genetically appropriate choices for plant materials to maintain biological diversity. University of California. Report to the USDA Forest Service, Rocky Mountain Region, Lakewood, CO.

Crash Course in Plant Conservation

According to the IUCN Red List of Threatened Plants, over 33,000 of the world's plant species are considered at risk of extinction. As their responsibility to contribute to plant conservation efforts increases in both urgency and scope, many botanic gardens, government agencies, NGO's, universities, and other organizations involved in plant conservation are in search of ways to develop and improve their skills in implementing effective plant conservation programs.

In response to this need, the U.S. Botanic Garden and Denver Botanic Gardens have undertaken a congressionally-supported collaboration to develop a training program in plant conservation methods and program development. There are two, one-week courses that can be taken separately or together on:

- ? *In-situ* conservation techniques used by plant researchers and land managers, including the conceptual and applied principles of threatened plant population management, monitoring, and restoration, held June 7-11, 2005 in Denver.
- ? *Ex-situ* conservation methods used in botanical gardens and other institutions, including seed banking and the applications of horticulture, held June 13-17, 2005 in Denver.

Applications are due by 1 April, 2005. For application forms and cost, see: www.usbg.gov/education/Certificate_Plant_Conservation.cfm.

...Did you know?

The Rocky Mountain Region of the U.S. Forest Service is a 22-million acre area that spans five states, and employs seven full-time botanists; one botanist per 1.5 million acres.*

* From: Forest Magazine 7(2): 17 of Spring 2005. (A botanists' responsibilities may include plant conservation, weeds, restoration.)

An Ethnobotanical Survey of Grand Teton National Park

By Evelyn Hill

The Greek word *ethos* meaning people, was used to form the word ethnobotany by John Harshberger "a prolific floristic and taxonomic botanist" in 1895 (Schultes 1995), thus describing the relationship between people and plants. My study is in three parts, first was the identification of around 300 species used for ethnobotanical purposes. During the summer of 2004 I began the second phase of locating ethnobotanical plants within the protected boundaries of Grand Teton National Park (GTNP) and the Rockefeller Jr. Memorial Parkway. The harvesting of seed specimens in the fall of 2005 will meet the third and final goal of collecting macrofloral material for charring to replicate plant material in hearths, for archaeological analytical comparison. These three phases will help create a basis for future archaeological, botanical and cultural investigations into the ethnobotany of the greater Grand Teton National Park biogeographical area.

Information on prehistoric, multi-tribal plant remains for 300 species was compiled from archeological site reports. These investigations dated 1976 through 1993, contain 16 sites in Grand Teton National Park from the Project Files of the Wyoming State Historic Preservation Office (SHPO), Laramie, Wyoming and the Midwest Archaeological Center (MWAC), National Park Service, Lincoln, Nebraska. Many of these archeological sites are clustered around the old shore line of Jackson Lake, as well as scattered throughout GTNP. These reports yield information on botanical and pollen species, charcoal and hearth analyses, and flotation work if it was performed.

These 300 species were used by Shoshoni, Blackfoot, Crow, Ute, Arapahoe, Gosiute and Western Plains and Rocky Mountain Tribes for the basic needs of food, medicine, utilitarian and ceremonial purposes from this greater ecosystem. This collection represents the first of its kind in the Grand Teton National Park (GTNP) or Yellowstone National Park (YNP) botanical and cultural anthropology disciplines. It ties together the prehistory of land, plants and people. Jacqueline St. Clair, Cultural Resource Office (GTNP) has indicated these specimens will be included in displays to park visitors as an interpretive aid for the public's education. Having these housed

together as a separate collection in the three different herbaria offers further study to individuals pursuing anthropology, archeology, botany and other disciplines. An ethnobotanical specimen may also have a second label or sheet of information containing emic categories, possibly having native terms for specific plants, native uses, perceptions and classifications, the environmental conditions of where it is located and bibliographic references for each particular plant.

Collecting a specific set of plants entails knowing their needs of season, weather and habitat for the stages of flowering and seed maturation. By staggering collecting times into two week intervals, I was able to coincide collecting with plant growth habits. For the 42 days spent in the field the results include 39 families and 70 species to date and their identifications are tentative, not yet verified (Table 2). Some of the plants I have searched for and not yet found may never be found, due to extirpation, transport into the study area, or historically incorrect identification. Plants could very possibly have been carried into the area by tribe visitation from long distances or traded for and, roasted and eaten, leaving only a few charred seeds behind as the evidence found in archaeological records.

Klara Varga, GTNP Botanist, and her staff, assisted me in locating several hard to find plant stands they have recorded in their data base. The entire GTNP has not been systematically collected and they are very interested in what I have and what I will find. Their data base is roughly 75 separate collections so far, and does not canvas the entire Park.

The original inspiration for this project began in the spring of 2004 when I was asked to help with the "Ethnohistory Project of Shoshone National Forest, through the UW Anthropology Dept. This coming summer, 2005, I will be locating more species on my list, working on the first set of ethnobotanical herbarium specimens and labels for three institutions, and sharing the wonder and joy of knowledge these plants have held for so long.

(Evelyn Hill is a 2004 recipient of the Wyoming Native Plant Society Scholarship, completing her masters thesis in Botany at the University of Wyoming.)

Changes in Soil and Vegetation Following Long-term Grazing Removal in Wyoming Sagebrush Steppe

By S. Madden, L.C. Munn,
A.L. Hild, P.D. Stahl and E.G. Pendall



Sagebrush enclosure study site, by S. Madden

Sagebrush grasslands are extensive in Wyoming, serve important watershed and wildlife habitat functions, and provide grazing opportunities for domestic livestock. As part of a cooperative research effort between the University of Wyoming and the Bureau of Land Management, more than 100 exclosures in such areas were established in the state starting in the 1950s. Many of these exclosures are intact today and are a valuable resource for investigating the effects of long-term grazing removal on these rangeland systems.

As part of on-going research on Wyoming's rangelands, we selected ten exclosures for study in sagebrush-grassland vegetation communities in Fremont, Washakie and Natrona counties to evaluate the effects of long-term removal of grazing by domestic livestock. We took measurements of soil physical and vegetation properties inside and outside each exclosure, systematically sampling microsites; under shrub, under grass and within bare interspaces. In semi-arid systems it has been suggested that 'resource islands' may exist under grasses and shrubs whereby increased nutrients are found in association with plant cover. We were interested to see whether soil physical properties were

affected by the presence of shrubs and grasses and long-term grazing removal.

The exclosures studied were established approximately 40 years ago. Following this long-term removal of grazing, we did measure some differences in soil and plant characteristics. We determined that soil surface roughness had increased inside the exclosures (see Figure 1). Soil surface roughness, or microtopography, is important for reducing rates of run-off and erosion following rainfall and snowmelt and for curbing wind erosion. Roughness also contributes to the presence of 'safe sites' for germination and establishment of plants by increasing moisture retention, humidity and shading.

We also found increased canopy cover of shrubs following domestic livestock removal, but no difference in the total density of shrubs. This suggests that the shrubs inside exclosures have developed larger crowns, possibly in the absence of browsing by native ungulates. Although exclosure fences were constructed to exclude cattle and sheep only, we felt that native ungulates may have also been deterred from entering exclosures.

Soil-water infiltration rates under bare interspaces differed from infiltration under grasses or shrubs. Inside the exclosures the infiltration was slower within interspaces but equally fast infiltration was found under grasses and shrubs. Outside the exclosures, infiltration was highest under shrubs but was not different under grasses and interspaces. Overall, infiltration rates were higher inside the exclosures under grass than they were outside exclosures.

Soil compaction (determined by bulk density measurements) was comparable inside and outside the exclosures, but soil compaction was greater within bare interspaces. There was more bare ground outside the exclosures than inside them. In combination, the higher cover of bare ground, higher interspace bulk density, and slower infiltration may mean that the overall infiltration and ability of the soils to hold onto water are lower outside exclosures. These differences may be important on a watershed scale particularly on sloping landscapes where intense thunderstorms may produce more runoff from grazed allotments.

We concluded that long-term grazing removal has effects on soil physical properties which can improve hydrologic processes even though these differences may not be apparent in the vegetation. Understanding these effects should allow better long-term management of Wyoming rangelands. In the absence of exotic annual weeds such as cheatgrass, more direct management such as prescribed fire may be a useful tool to reduce shrub dominance on a rangeland site following long-term grazing removal.

Continued research in a variety of topographic settings will help develop a better understanding of how long-term grazing removal would affect hydrologic processes at a landscape scale.

(Sally Madden is a 2004 recipient of the Wyoming Native Plant Society Scholarship, completing her masters thesis in the Department of Renewable Resources at the University of Wyoming.)

Wyomingites at Heart

Far-Flung Native Plant Society Members

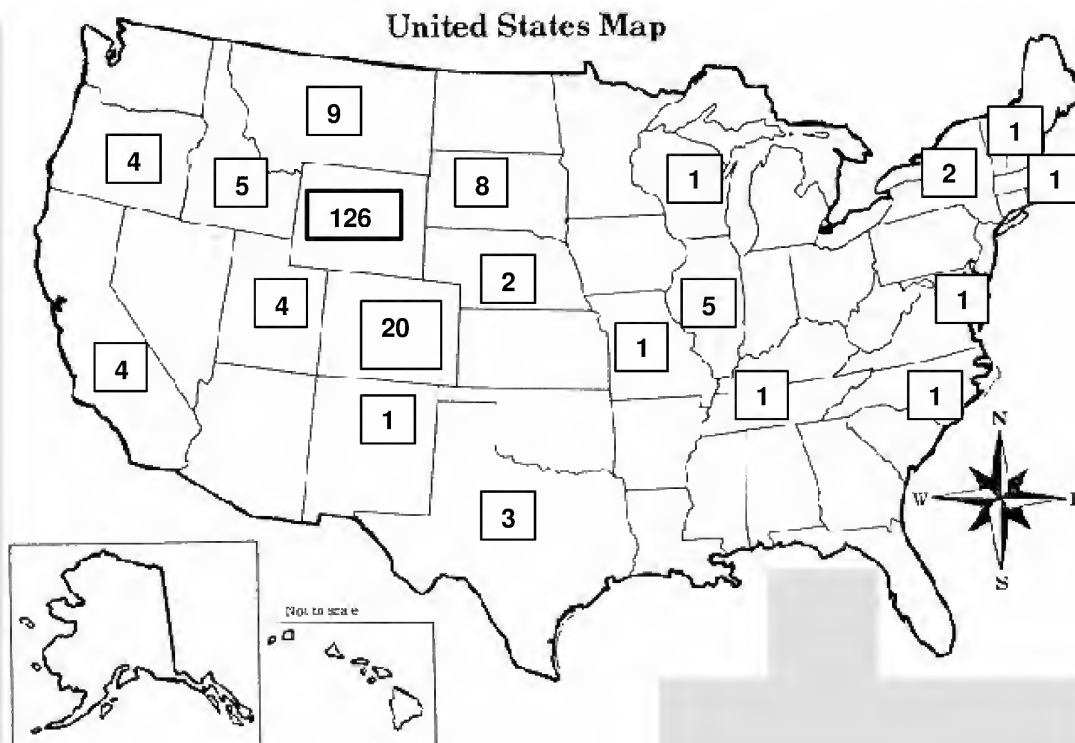
Everyone interested in Wyoming native plants and vegetation is welcomed as a member of Wyoming Native Plant Society (WNPS). What does this mean for folks outside of state boundaries? The article by Thea Unzner (next page) prompted a profile of widely-distributed WNPS members.

The rationale varies -- WNPS members from afar may affirm their present pursuits and stake in Wyoming. They may belong after previously living in Wyoming or pursuing past botany work, studies and adventures in the state. Membership may provide regional perspectives in nearby areas of mountains and plains. People may join to get the news, information, camaraderie, or spurts of humor. Finally, WNPS membership may be a simple token of interest and care. For any and all reasons -- THANK YOU.

Wyoming Native Plant Society exists to promote an appreciation of Wyoming plants and spectrum of plant-pursuits (taxonomy, ecology, range and forestry sciences, gardening, mycology, paleoecology,...) to name a few. The following map of far-flung Native Plant Society members is derived from current membership records. bh

*Reminder: Articles from **all** members are welcome!*

Rangewide Distribution of Wyoming Native Plant Society Members



...includes Germany and Russia!

Why is a German Woman Interested in Wildflowers of Wyoming?

By Thea Unzner

(Several years after the fall of the Berlin Wall, an outpost of the Wyoming flora sprung up near East Berlin at the home of Thea Unzner and family, long-distance member of Wyoming Native Plant Society. Her original gardening interests took her on a path of many discoveries, including discovery of relatives she has in Wyoming, and the shared and unique genera of plants on two continents.)

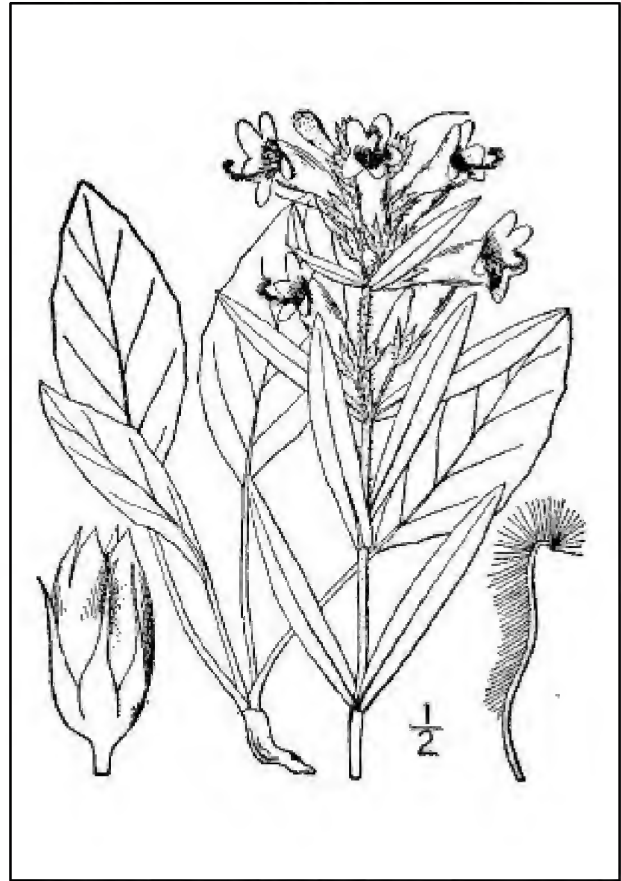
When I first came to Wyoming in 1999 for a visit to my relatives in Jeffrey City, I found quite a different landscape there compared to the one I am used to living in. I was overwhelmed by the boundless, wide open space, the vast plains and the infinite sky high above all. Where I live in East Germany, in an area with sandy soil, there are forests everywhere and the sun rises behind the trees and disappears in the evening behind the treetops.

When you come as a foreigner to Wyoming, you see again and again the gray sagebrush steppe, interrupted by rocks and ranges of hills. It is hard to believe what a richness of wildflowers is growing between the shrubby sagebrush.

As a member of the American Penstemon Society, I looked first for Penstemons around the ranch of my cousin. I did not have to go too far, as the rocks in front of the house were all blue with *Penstemon virens*! And when I walked farther, I found species of *Erigeron*, small *Allium*, *Antennaria*, *Phlox*, *Eriogonum*, *Astragalus*, *Oxytropis*, *Heuchera*, *Cryptantha* so many well-known plants and some exciting unknown plants!

I took lots of photos every year when I visited my relatives in Jeffrey City, Lander and Riverton. Time and again I discovered more plants, particularly in the Green Mountains. I was quite fascinated by the flora. There were slopes in the Green Mountains full of yellow *Balsamorhiza*, roadside mats of violet *Astragalus*, and pasture carpets of white *Phlox* and yellow *Haplopappus*. One year I was so glad when I saw the wonderful pink flowers of *Penstemon eriantherus* for the first time, and in another year, hundreds of *Lewisia rediviva* that had opened their pink starflowers.

In wintertime I looked at all my new American plant books, translated the descriptions, compared my photos with the pictures in the books, and bit by bit I found out the right names of most of the plants I saw in Wyoming.



Fuzzytongue penstemon (*Penstemon eriantherus*)

Illustration from: Britton, N.L., and A. Brown. 1913. *Illustrated flora of the northern states and Canada*. Courtesy of Kentucky Native Plant Society. Scanned by Omnitek Inc. Usage Guidelines

...But not all - I am not sure about all of the species of *Cryptantha*, *Astragalus*, *Oxytropis*, *Phlox*, *Physaria* and *Erigeron*.

A friend from Saratoga once sent me the newsletter of the Wyoming Native Plant Society. I joined and I am glad to learn more about Wyoming's flora now.

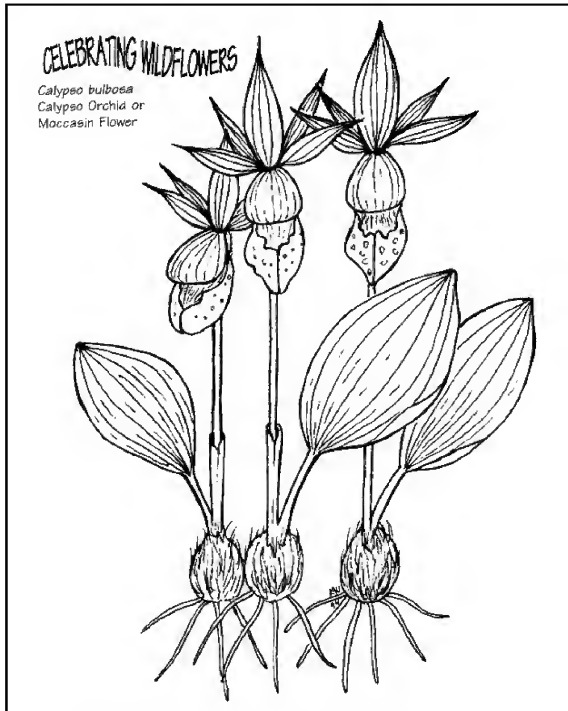
My relatives are the descendents of my father's brother, who emigrated from Berlin to Wyoming in the 19th century. He followed the call of his uncle August Lanken, who was one of the first settlers in Wyoming and had a cabin just on the foot of the hill which has now the name after him: Lankin Dome. I found something about him and my uncle Emil Jamerman in the Archives of Wyoming in Cheyenne.

This year in June, I'll travel again to Wyoming, shall look again for flowers, and am hopeful to find new ones.

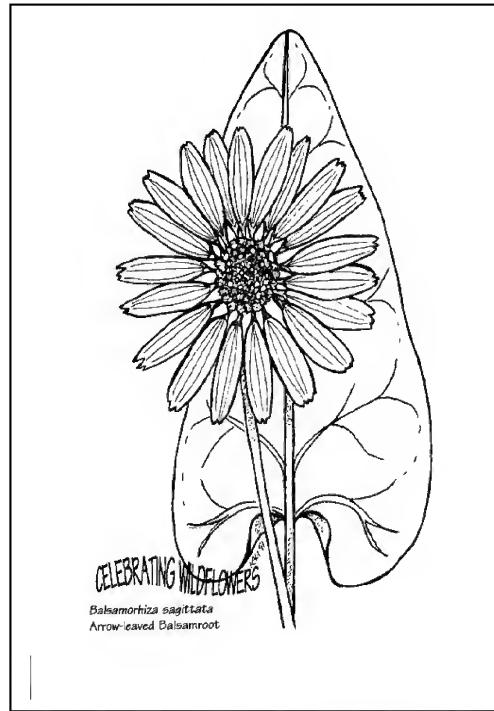
A Blooming Bounty

A botanical bounty of illustrations by Karl Urban is posted on the internet as part of the National “Celebrating Wildflowers” initiative (<http://www.nps.gov/plants/color/northwest/24.htm>). Urban was an esteemed Oregon botanist, educator and artist. The illustrations include many plants that reach the mountains and plains of Wyoming. You might consider them if you are looking for ways that students can explore plant life of Wyoming, indoors and outdoors, by books and through their own creativity (see also “plant ID” at the WNPS homepage for Wyoming flora references, http://www.uwyo.edu/wyndd/wnps/wnps_home.htm).

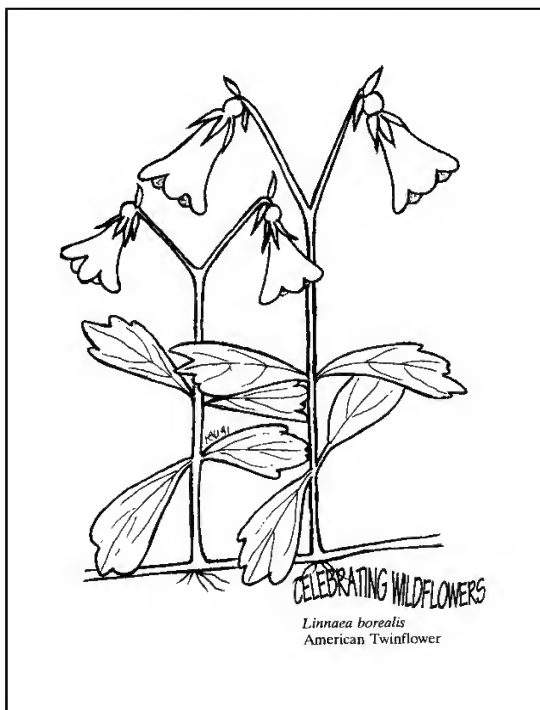
Note: Both native plants AND noxious weeds are featured among illustrations!



Fairy-slipper orchid (*Calypso bulbosa*)



Balsamroot (*Balsamorhiza hirsuta*)



Twinflower (*Linnaea borealis*)



Dalmatian toadflax (*Linaria dalmatica*) – noxious weed!

The Life and Times of Stuart Markow

By Walter Fertig

It was with surprise and sadness that I learned of the passing of my long-time friend, classmate, co-author, occasional employee, and colleague, Stuart Markow on Thanksgiving weekend 2004. Summarizing the enormous and positive impact Stuart had on the lives of so many people in the botanical community of Wyoming and the west is difficult. Stuart was many things - an excellent teacher and expert botanist for sure, but also a kind-hearted soul and about the funniest guy I've ever known.

I first crossed paths with Stuart in September 1990, where we were beginning our graduate careers in botany at the University of Wyoming under the tutelage of Ron Hartman. We both had similar research projects – mine a floristic inventory of the western Wind River Range, and Stuart's a comparable study of the flora of Targhee National Forest along the Wyoming/Idaho state line west of Jackson.

We shared an office on the third floor of the Aven Nelson building with Tim Evans, another Masters student working on the taxonomy of *Oenopsis*. Tim and I weren't quite sure what to make of Stuart at first – he was very earnest and seemed to prefer keeping to himself. In time Stuart opened up and we realized just what a quick wit he had. Pretty soon we advanced to practical jokes, usually with Stuart and me victimizing Tim, or Tim and me getting Stuart. These were all harmless pranks, like filling Stuart's desk full of Styrofoam packing foam, or completely intermixing the contents of different cans of gourmet coffee that another officemate proudly maintained, or various tomfoolery in the Rocky Mountain Herbarium that was blamed on Bill Smith's lab for years (I believe the statute of limitations on pranks is 10 years, so I can confess to this now). Eventually Stuart pulled what I still consider the most diabolical and cunning practical joke of all time (at my expense, of course) – the infamous “Little Caesar's Pizza Prank”. Space and embarrassment preclude me from recounting this more fully – needless to say it forced my retirement from practical joking for good. I knew when I was licked.

We spent a lot of late nights in the herbarium working on our plant collections, talking shop, recounting *Monty Python* movies, solving the mysteries of the cosmos. At least once a week we

would order a pizza from PizzaTime, the local discount pizzeria (which sadly closed not long after Stuart and I graduated, apparently due to a large drop in business). Stuart was the only person I've ever known who ordered pizza without tomato sauce. Otherwise he seemed to subsist on non-fat Wheatables crackers, textured vegetable protein patties reheated in a microwave, and diet Mountain Dew. He always drank that vile brew in a paper cup because he said he didn't like the taste of the can. I never could convince him that the soda had been immersed in the can since leaving the bottling plant.

Stuart's prowess as a teacher was apparent from the outset. The time he spent preparing for his lab courses was legendary. Early on (before he had thousands of plant specimens of his own to identify), Stuart would regularly attend 3-4 different lecture sessions of General Biology to make sure he knew everything his students were learning. He easily spent 24 hours a week preparing for his 2 hour lab. Our first semester he used to drill Tim and I with lab-related questions any time we set foot into our office. After stammering out some unprepared response to a query about mitosis (I was just going in to get a pencil from my desk after all) Stuart would inform me that I missed some trivial point, at which time I would tell him he was ready for that week's lab. Stuart always had a steady string of students hanging around during office hours for his patented one-on-one tutoring. Those lucky students were certainly learning more from him than they were from their uninspiring professors. For his efforts Stuart won several teaching awards, including the prestigious Ellbogen award – a prize that came with a substantial cash remuneration.



Courtesy of Lynn Moore

Stuart's favorite subject to teach was botany – specifically how to identify plant species in the lab and the field. He had an amazing memory for the most insignificant details and a gentle, easy-going teaching manner infused with good humor. Soon he was providing plant i.d. services for any number of students from other disciplines – ecology, wildlife biology, and range science – who really needed his help and were always grateful in kind.

In 1992 as I was finalizing my thesis I got a job as the state botanist for The Nature Conservancy's natural heritage program (Wyoming Natural Diversity Database). One of the projects that I inherited was supervising Stuart's research grant for his master's project in Targhee National Forest. This could have been awkward, but Stuart handled it quite well. I helped him complete the required report for the Forest Service and this led to many more collaborations over the ensuing decade. Stuart and I co-wrote a half dozen technical reports, one of which was published as a book by the Forest Service in 2001 ("Guide to the willows of Shoshone National Forest"). In our professional relationship he was always a valued advisor, sounding board, and critic – one of the people I really relied on for my work.

Stuart graduated with his Masters in 1993. I still remember the final seminar he gave to the Botany Department summarizing his research. He spent weeks practicing and had it down cold – forward and backward. As luck would have it, the bulb in the slide projector burned out halfway through his talk – in fact, as Stuart was in mid-sentence telling a joke. It took about 5 minutes to get a replacement projector set up and order restored, but to everyone's amazement Stuart picked up in mid sentence and completed his funny story, as though nothing had happened! It was one of the most amazing things I've ever seen and has become a legend in the annals of University of Wyoming botany.

After graduation Stuart took a number of seasonal jobs for the Forest Service and National Park Service in Montana, Wyoming, Idaho, and Utah. Unfortunately, he never did land the permanent botanist job he really wanted and deserved. This was one of the few times I ever saw Stuart get discouraged. Stuart tried his hand at teaching (general biology at Western Wyoming College and summer courses in botany at Teton Science School) and consulting with better results. Fortunately Stuart's wide network of friends helped steer enough projects his way to keep him employed and in Wheatable snacks.

In hindsight, I think the seasonal life may have been ideal for Stuart. It gave him the opportunity to do what he truly loved every summer – perambulating about the woods hunting for rare and curious plants, training colleagues in the intricacies of willow and sedge taxonomy, and teaching classes for the science school or the native plant society. He earned enough money in



Stuart Markow, photo by Jean Wood

summer to persist through the winter in Laramie, hang out at the Rocky Mountain Herbarium, write articles for *Castilleja*, and give comfort and aid to the latest crop of fresh-faced floristic graduate students in need of help. Ron Hartman and I, and later Bonnie Heidel, always had some projects for him to do too.

In many ways Stuart had the trappings of a mystic. He lived a very ascetic life style – eschewing most material things. In later years when Stuart was doing summer work out of state he would ask me to periodically check in on his tiny Laramie apartment. I was always amazed at the few possessions he accumulated. Whenever he called to see how things were going I would tell him that his apartment had been broken into and all that was left was his cardboard box coffee table, bike, vacuum cleaner, and a bare light bulb. He would always respond, no – nothing was missing!

His frugality was the stuff of myth, too – perhaps a byproduct of his Yankee upbringing. Stuart was always mending a pair of worn-out canvas sneakers or trying to get another season out of a pair of dilapidated hiking boots. When one thread-bare shirt got too worn he would just start to double them up (or even wear triple layers in winter). Yet Stuart was an amazingly giving person – always there to offer assistance when needed, always giving of his time and energy.

There were many other contradictions. Few knew that Stuart was a champion athlete in high school and a master at table tennis. For someone who claimed to never watch television, Stuart had an amazing comprehension of 1960s TV sitcom trivia. When not reciting botanical minutiae, Stuart could just as easily recount every bit of dialogue from *Monty Python* or any *Calvin and Hobbes* or *Far Side* cartoon ever printed.

Stuart liked to be in control of his own destiny. I think this is why he seemed to be forever holding out for his dream job – one I think really didn't exist. After I left Wyoming to become a federal botanist in Utah I tried to tell Stuart that working for the government full time actually involved much more paperwork, bureaucracy, and pointless meetings than just looking for rare plants everyday. Deep down, I think Stuart knew this, and realized how fortunate he was working seasonally and doing just those things he wanted to do. His desire for control extended to his friendships – making it somewhat difficult for those who liked him. It was nearly impossible to get Stuart out in public – certainly never to a restaurant or rarely to a party. Stuart often kept people at an arms length, which frustrated many, especially any number of smitten women. I don't think he ever did this out of spite or meanness, he just was very private and perhaps afraid of opening up too much, or of relinquishing self-control.

Stuart liked to cultivate an image of mysteriousness about his personal life and past. For years I tried (unsuccessfully) to find out when his birthday was and this became one of many running gags in our life. One of the few things he ever did volunteer about his life before botany was that he had once worked in a pizza parlor. I immediately generated a rumor that he had worked in a mafia pizza shop, had seen too much, and had been shipped to Wyoming as part of the federal witness relocation program. Stuart would never confirm nor deny this.

I feel like I knew Stuart pretty well, which makes his suicide difficult to understand. I don't believe for a moment that he took his life out of malice to another, and I think he would be startled and mortified to know the anguish he has brought to so many friends. My suspicion is that he was in failing health – something confirmed by his forest service colleagues in Oregon. Stuart loved life and loved what he did – teaching and hiking, finding new botanical discoveries, but most of all being outdoors and independent. I think the idea that he might become physically incapable of doing this, or of becoming a burden to others, was too much for him to contemplate and he acted appropriately, at least as he saw it. I'm sad that he made that choice by himself, though I know his stubbornness well enough that he wouldn't have been dissuaded. I take an odd comfort in thinking that Stuart chose to end his life on his terms, rather than those of his

body or someone else. This is the way he wanted it.

These past few months I've been filled with happy memories of my days and adventures with Stuart. I'm so glad I had the time I did with him, though sad there won't be any new memories. Stuart left an enormous legacy – in the field of botany and the hearts of many, many friends. May we all be so fortunate.

Stuart Markow: Some Highlights of a Career in Wyoming Botany

1991-93: Conducted a major floristic inventory of the vascular flora of Targhee National Forest in NW Wyoming and E Idaho (13,741 specimens of 1006 taxa) as part of his Master's Thesis in Botany from the University of Wyoming

1992: Received Ellbogen Award as outstanding graduate teaching assistant at the University of Wyoming

1992: Discovered first occurrence of *Lithospermum arvense* in WY

1992-2004: Unofficial "botanist in residence" at the Rocky Mountain Herbarium, assisting graduate students with plant identification questions and tips on keying Poaceae

1993: Completed report on the rare vascular plants of Targhee National Forest, documenting new locations for 18 species of special concern

1995-2000: Reviewed and corrected identifications of the entire herbarium of Grand Teton National Park and the park collections at Montana State University and the University of Wyoming

1996: Conducted surveys of sensitive plant species and the general flora of the Rendezvous Mountain area in the Teton Range for Bridger-Teton NF

1996-2003: Taught summer wildflower identification classes for Teton Science School

1995-2003: Frequent contributor to *Castilleja*, including features on WY's carnivorous plants, Thomas Nuttall, biological soil crusts, sedges, tall forb communities, fall wildflowers of the Tetons, and the flora of Teton and Darby canyons

1998-2004: Conducted rare plant surveys and assisted with preparation of technical reports on *Artemisia biennis* var. *diffusa*, *Cymopterus evertii*, *Stephanomeria fluminea*, willows, and rare plants of SW Wyoming for the Wyoming Natural Diversity Database

Yellowstone Institute Courses

Plant-related courses offered by the Institute for 2005 are listed below, with dates and instructors. For further information, contact:

Yellowstone Association Institute
P.O. Box 117
Yellowstone National Park, WY 82190
www.YellowstoneAssociation.org
307 344-2294

Spring Wildflowers: June 7-8, Jennifer Whipple

Wildflowers for Beginners: June 19, William Edwards

Art of Wildflower Identification: July 7-9, Meredith Campbell

Lichen and Mosses in Yellowstone National Park: July 9, Sharon Eversman

Alpine Wildflowers: July 9-11, John S. Campbell

Plants of the Lewis & Clark Expedition: July 18-19, Wayne Phillips

Wildflowers and Wildfire: July 20-21, Wayne Phillips

Wild Edible Plants and Medicinal Herbs: August 20-22, Robyn Klein

The Wyoming Native Plant Society, established in 1981, is a non-profit organization dedicated to encouraging the appreciation and conservation of the native flora and plant communities of Wyoming. The Society promotes education and research on native plants of the state through its newsletter, field trips, and annual student scholarship award. Membership is open to individuals, families, or organizations with an interest in Wyoming's flora. Members receive *Castilleja*, the Society's quarterly newsletter, and may take part in all of the Society's programs and projects, including the annual meeting/field trip held each summer. Dues are \$7.50 annually. To join or renew, return this form to:

Wyoming Native Plant Society
P.O. Box 2500
Laramie, WY 82073

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(*\$7.50 goes to the annual scholarship fund*)



Wyoming Native Plant Society
P.O. Box 2500
Laramie, WY 82073